

## TITLE OF THE INVENTION

Name: Herbert Lehman Williams

Citizenship: U.S.

Residence: 109 Rivers Edge Drive, East Palatka, FL 32131

Title of the invention: Hydroelectric turbine

CROSS-REFERENCE TO RELATED APPLICATIONS "Not Applicable"

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR

DEVELOPMENT "Not Applicable"

REFERENCE TO A MICROFICHE APPENDIX "Not Applicable"

## BACKGROUND OF THE INVENTION

In existing hydro systems, whether low or high head, the runner (or blade) converts rotational energy to torque energy in a shaft. Patent # 98,552 is a common type shaft driven turbine. Patent # 09/231,063 is a more recent open center, peripherally driven turbine. The embodiment eliminates the shaft. It converts flow energy directly to electricity by the use of magnets imbedded in the periphery of its blade and cores imbedded in its housing. As the blade is rotated by the flow, electricity is produced in the windings of the core.

The embodiment is a combination of what is old (the open center turbine) and what is new (a free floating turbine blade which is a rotor).

## BRIEF SUMMARY OF THE INVENTION

Present turbine designs, whether open center or central shaft type, produce electricity by the use of generators. This invention produces electricity by combining the turbine and generator in one unit. Instead of the hydroelectric turbine producing the energy to turn a generator, the hydroelectric turbine is the generator.

A water flow through the rotor blade causes the rotor blade to rotate. The rotation of the blade causes a magnetic field necessary to produce electricity from the coils. The coils are connected together in such a way as to produce the desired voltage and current to pass through conductors to an electrical land based grid.

The opposing force of one group of magnets aid in maintaining alignment of the rotor blade on its horizontal axis.

The opposing force of another group of magnets, in conjunction with a water lubricated bearing material, aid in preventing the rotor blade from being forced downstream.

An additional aspect of the embodiment is that the rotor (blade) is free floating in the turbine housing and is not mechanically attached to the housing. Central alignment has been achieved by embedding opposing magnets in both the blade periphery and the housing interior on a plane perpendicular to the axis of the turbine. To prevent the blade from being forced downstream by the water flow, opposing magnets have been embedded in the blade periphery and the housing parallel to the axis. To prevent the blade from moving forward or falling out of the housing during shut down or maintenance, stops are mechanically attached to the interior of the housing upstream of the blade.

The magnetic field necessary to produce electricity occurs inside a non-magnetic material which:

- a. eliminates excessive saltwater which is not compatible with the high intensity magnetic field necessary for the production of electricity;
- b. acts as a bearing surface to help maintain horizontal alignment of the blade (rotor).

#### **BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING**

FIG. 1 is a front view of the open center hydroelectric turbine without stops (for sake of clarity).

FIG. 2 is a cross-section view taken at the centerline of the turbine section.

#### **DETAILED DESCRIPTION OF THE INVENTION**

The housing (1) is either anchored in a body of water (low head application), fixed in a dam (high head application) or attached to the interior of a pipe. Whatever the application, housing (1) is stationary.

The outer rim (2), blade (3), inner rim (4), magnet (6), magnet (8) and magnet (9) are fixed as one unit and rotated by the water flow.

The magnet (6) and core with windings (5) do the work of producing electricity.

The magnets (8) and (7) do the work of alignment to the axis.

The magnets (9) and (10) prevent blade (3) from being pushed downstream by the water flow.

The stop (11) prevents the runner from moving upstream.